THE

AMERICAN

MATHEMATICAL MONTHLY.

BIOGRAPHY.

CHARLES HERMITE.

By DR. GEORGE BRUCE HALSTED, Austin. Texas.

The fourteenth of Janunry, 1901, should be marked with a black stone in the annals of mathematics. Then the eminent geometer, the incomparable man, the great Hermite, one of the glories most pure of France, was lost to science, and implacable death threw into mourning his family, his friends, and his admirers.

As mathematician of the first rank he leaves to the glory of his country and of all humanity a superb scientific monument erected in sixty years completely dedicated to "his dear *analyse*" (to use one of his phrases) and to preparing by the infusion of his genius placed at the service of teaching that galaxy of illustrious mathematicians who now so much adorn our sister nation. Like Sturm, he united in an extraordinary degree the qualities of professor who wins the love of his disciples to those of one who inculcates the love of science for science. Endowed, like his compatriots, Pascal and Clairaut, with singular precocity, we see him, yet a scholar of the Lyceum Louis le Grand, win the prize for mathematics with a noteworthy thesis, and shortly after, as student of the Polytechnic School, attract the attention of Jacobi with his first works and place himself as of right in the first rank among the analysts of Europe.

It is not our object to make a minute analysis of the works of the great

geometer, to which would be necessary time and competence that we lack : our aim is much more modest : we seek to render what is heart-felt homage to the man we have so deeply venerated and from whom we have received infinite proofs of benevolence during the fifteen or sixteen years that we have had the honor to possess his friendship in so many ways precious. It is not possible, speaking of Charles Hermite, to fail to say how in the higher analysis, in algebra and in the theory of numbers one encounters everywhere the footprints of his giant tread. How could we leave unmentioned his memoir on the exponential function, where in demonstrating the transcendence of the number e he opens the way which eleven years after conducted Lindemann to the demonstration of the analogous property of π, solving in negative form the celebrated problem which for two thousand years had in vain fatigued geometers ?

Nor can we pass in silence the enormous contribution which Hermite brought to the *Theory of Forms* : his law of reciprocity, his admirable researches on associate covariants, his works on quintic forms, his memoir on the equation of the fifth degree, and his celebrated theorem having Sturm's as corollary.

The works of Charles Hermite in the theory of functions are a new revelation of his genius. His profound investigations on Abelian functions, their division and their transformations, as also those relative to elliptic functions, form a monument of glory erected to French science, disclosing the sagacity of the grand analyst in the facility with which are deduced from the most lofty analytic investigations, corollaries which unveil difficult properties of the theory of numbers.

Neither can we neglect to mention the work *"Sur quelques applications des fonctions elliptiques"* (1885), of which only the first part was published : in this are found the beautiful applications of these functions which conduct him to the general integral of the equation of Lamé on the equilibrium of temperature of a homogeneous ellipsoid, which leads the author, in two particular cases, to the study of the rotation of a solid body around a fixed point (when there do not exist accelerating forces), treated by Jacobi, and to the consideration of the conic pendulum. So far as we know, Hermite leaves two didactic works : his *"Cours de la faculté des sciences de Paris"* (1891), and his *"Note sur la théorie des fonctions elliptiques"* (168 pages) which serves as appendix to the *Cours de calcul differentiel et integral* of J. A. Serret (4th ed. 1894). We have from him also two brief but interesting notes on the invariants of binary forms of the 5th and 6th order in the French translation of Salmons Higher Algebra.

The French geometer had the good fortune not granted all great men to see recognized in his lifetime by the scientific world his extraordinary merit. The 24th of December, 1892, his sixtieth birthday, the friends, the disciples, the admirers of the great geometer assembled at the Sorbonne to present him the gold medal struck in his honor by international subscription. The illustrious artist, Chaplain, cut upon it the bust of the one commemorated and translated onto metal with admirable fidelity his venerable face, affable and frank, illuminated by the scintilla of genius. The Minister of Public Instruction, M. Ch.

Dupuy, presented to Hermite in the name of the President of the Republic the insignia of Grand Officer of the Legion of Honor, and the messages were read of those who from various parts of the world associated themselves with the splendid ceremony.

High testimony of admiration and sympathy was offered the great geometer more recently upon the occasion of the meeting at Paris, last August, of the international congress of mathematicians. The Congress sent him a telegram of admiration and sympathy (he was at Saint-Jean-de Luz). This act caused vast satisfaction and profound emotion to the scientist, as he wrote me in one of his last letters.

Hermite retained to the last day of his life his privileged intelligence; but his body suffered. In a long letter of his, a few days before his death, he complained of his attacks of asthma and of the lack of appetite and of sleep: he seemed to forsee the nearness of his end, so that sending me one of his works he said that this would be without doubt *the last*! and that he had in great part accomplished it at Saint-Jean-de Luz, whereby the benefit of the mild climate had reawakened his mathematical activity. This last work is a letter to Professor Pincherle published in tomo V of the "*Annali di Matematica*." He told us also that he had sent a brief article to the new journal "Le Matematiche" of Prof. Alasia.

We will end by expressing a wish We wish that those who have the authority would take the initiative toward an international subscription for a work containing an extended biography of the ever memorable geometer, and a minute analysis of his works; perhaps might be added some brief articles by very illustrious living mathematicians; something, in fine, which would be as a funeral crown offered to the memory of the great dead.

[Written by Juan J. Durán-Loriga for *Le Matematiche*, and translated by the English editor, G. B. Halsted.]

A PROBLEM AND ITS SOLUTION.

By EUPLIO CONOSCENTE, B. Sc., Math. D., Member of Circolo Mathematico di Palermo, New York City.

Find that one of these curves $(x^2 + y^2)^3 = a^3(x^3 - 3xy^2)$.

I. (a) is the locus of such points that the product of their distances from the vertices of a fixed equilateral triangle is equal to the semi-parameter. (b) The bitangents each touching the curve in two real distinct points are parallel to the sides of the fixed triangle and their six points of contact are on a circle. (c) The sides of the equilateral triangle obtained by the tangents each touching the curve in its three farthest real points from the origin of coördinates are parallel to the tangents of its real triple points. (d) Some other property showing the form of this curve.